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The Effects of Creative Experience-Centered Environmental Education on Emotional Intelligence of Elementary School Students

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ABSTRACT

This study was carried out with the purpose of verifying the impact that experience centered environmental education with an emphasis on communing with the surrounding natural environment could have on elementary school student`s emotional intelligence.

This experiment was carried out on a group of 55 students (29 in the control and 26 in the experimental group) from two 4th grade classes. Following the development of experience-oriented lessons on environmental education based on a 'teaching and learning' model of environmental education for this study, the lessons were applied for 30 lessons and over a 16-week period. The experiment was carried out using a checklist of emotional intelligence and administered by a pretest-posttest method.

The results of the study, signs of improvement were recognized in ability to recognize self-emotion ($p < .05$), ability to control self-emotion ($p < .05$), interpersonal skills with a significant increase ($p < .01$), self-synchronization ability ($p=0.183$), and empathic ability ($p=0.058$).

Therefore, it is evident that a positive effect on the increase of emotional intelligence in elementary school students is achieved through creative experience-oriented environmental education.

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I. Introduction

A. Necessity of research

For a long time now, problems in the environment have been recognized as an extremely important challenge in people's lives. Even in the process of international trade and negotiations, more emphasis is being placed on environmental issues as indicators of national competitiveness. However, because environmental problems are fundamentally attributed to people's misconceptions of the environment, they are also key in solving such problems, and it is therefore evident that the effective method to accomplish this is environmental education (Son, 2015).

In addition, Environmental education in schools should be integrated as in the case of life education. This is based on the grounds that education which allows for the acquisition of desirable attitudes and values, and problem-solving capability through activities of direct experience, is above all else most important (Son 2017). In other words, we must move away from the environmental education at school which provides simple information and knowledge related to environmental issues, and must seek out creative activities and experience oriented practical methods which are able to transform attitudes and values.

From the 2007 revised curriculum, constant emphasis was placed on creativity and character education which utilized various places and various times inside and outside of school, and it became necessary to develop creative experience-based activities which could not only be organized and operated as curriculum suitable to a school's environment but also be a course that students would voluntarily participate in and would foster them as competent individuals (Ministry of Education, 2015). In this context, instruction of environmental education is experience centered, and a plan can be utilized which would integrate it throughout all related subjects. Especially, there is great significance in environmental education which can connect home and community in the elementary school years when daily habits are affects the formation, and having students practice environmental conservation would be seen as helpful.

Now that we understand the present situation, activities to predict and prevent future environmental problems are also a very important element of environmental education. There should not be interest in mere fragmentary expressions of a student`s behavior such as the current desirable decisions they make and practical activities they do, but students need to understood with a comprehensive concept. In other words, it can be said that comprehensive ability should be fostered which can control all aspects of the human life such as self-awareness, dealing with emotions, self-synchronization, understanding the

feelings of others, interpersonal relationship maintenance, etc. Especially living in modern society, the ability to control self-feelings/self-esteem is becoming important. Such a concept of emotion conception is called emotional intelligence. In conclusion development of emotional intelligence can be said to be an important influencing factor on the quality of human life including environmental problem solving (Son and Son, 2010; Son and Son, 2017). Emotional intelligence can be improved through various methods. Its formation/form undergoes changes through infancy and adolescence, and it transformed due to the environment and experience which are made possible through parents, teachers, and peers (Cho, 2004). Accordingly, it would seem to be important that the school provide students with an educational environment which is able to develop emotional intelligence. In particular, plants and animals, along with experiential activities about the environment, can have a large influence on emotional development (Koo, 2003). Due to the fact, however, that at school it is realistically difficult to have enough such environmental activities, it will be necessary to first create conditions suitable for environmental activities, even if only in students' living space of the school classroom.

Particularly in the case of school, it is evident that among all the settings which have a large influence on growth and development of students, it is the classroom with its atmosphere that is structured and systematic where students' school life is mostly spent. Because of this irregardless of the teacher's intentions, students can be seen as living under the influence of the classroom environment (Lee, 1993). Since this was a study on environmental education, the first priority was that the school classroom environment be transformed into an environmentally friendly one. Then a program in the form of a class on the environment which uses creative experience-oriented activities was developed and applied in order to discover the changes in emotional intelligence of the elementary school students.

B. Purpose of study

The purpose of this study is to examine the effect of creative experiential-activity centered environmental education on elementary school students' emotional intelligence in order to verify that environmental education can be linked to a person's comprehensive ability. The specific goals are as follow:

1) To develop a program in which students can engage in experiential activities in sustainable, self-directed environmental education.

2) To verify the influence creative experience-based environmental education activities have on elementary school students' emotional intelligence.

II. Theoretical Background

A. Creative experiential activity

In order to institutionally ensure the autonomy and discretion of schools, teachers, and students, extra-curricular activities and discretionary activities were integrated and developed into creative experiential activities. Creative experiential activities reflect the desired goal of teaching subjects together with special activities/ extra-curricular activities through the school curriculum, and provide the opportunities to realize such goals. However, in the process of organization and operation of creative experience-based activities through an expansion of the autonomy of a school principal and teachers along with the development of self-initiative in students, field centered and learner centered curriculum are able to be saved. Creative experiential activities are a way to break away from a textbook-based system of education, and in order to increase a student's direct experience activities and self-driven learning ability the non-curricular activity has a complementary relationship with the curriculum/subject. In this process active practice is learned, and through sharing and caring, people with both creativity and good character are nurtured (Ministry of Education, 2015). <Table 1> presents the focus on creative experiential activities

<Table 1> Focus on creative experiential activities

Division	Focus
Elementary school	The basic living habits, Cultivate a sense of community, An expression of personality and aptitude
Middle School	Formation of attitude to live with others, Inquiry into career, Self-concept and establishment
High School	Inducing various needs of learner, Forming good human relations, Career choice, self-realization

Creative experiential activities based on autonomy are used as group activities and they consist of the four areas of ‘voluntary activity’, ‘extracurricular activities’, ‘volunteer work’, ‘career activities’. Each activity is selected at the school to suit the distinct features of the student, class, grade, school and community; can be carried out with flexibility. And with the 4 domains and activity contents, through an advisory nature, the school can select and run even more creative and richer educational subjects. In elementary schools, in the case of environmental education, we must also move away

from the method in which fragmented education is run in existing courses and subject contents should be restructured to be suitable for the school and community.

B. Environmental education

Due to the emphasis which was placed on key concepts of environmental education in the recent 'Education for Sustainable Development' (ESD), it can be said that many new concepts were added to environmental education. Environmental education can be said to have an interdisciplinary nature for the development of citizens who are well-equipped with knowledge and understanding of the environment (Son, 2015). Therefore, environmental education makes a good environment which can set its purpose to raise public will and ability to participate in investigation, problem solving, good decision making, and action, all of which will help you achieve and maintain a good life (North American Association for Environmental Education: NAAEE). In order to enable the youth of future society to lead with this kind of responsible environmental action, the main path towards acquisition of environmental literacy and its related knowledge, attitude, function, and action can be the division into school environmental education and social environmental education. Understanding interaction of school education and social education, and an integrated environmental education of individual factors which can influence our knowledge, function, attitude, and behavior about the environment are seen to be important.

Human beings are born in nature, live in nature for a time, and then return to nature which means human life which departs from nature cannot exist. The environment is not only the natural environment, but is everything that surrounds human beings, and education can refer to the activities which teach such knowledge, function, emotion, attitude, and values as are required to perform a role as a member of society. Therefore environmental education is understanding the relevant relationship between human beings and nature, and having the correct values and moral views of the environment so as to create a good environment to live in (Son, 2017). Consequently, environmental education is not just education on the environment in and of itself, but begins with understanding of the relevance and interdependence of various elements that make up the environment.

Although the act of learning about the environment and related contents is important in elementary school environmental education, in light of the efficiency of environmental education through real life experiences, instruction may be more efficient if environmental education content is separated systematically and the content to be taught is determined (Son and Son, 2017). In other words, when the surrounding environment and process of recognizing nature's current condition is connected with real life

experience, in a system of direct education, the educational effect will be increased. Accordingly, connecting the experience children have in their surrounding environment with the process of recognizing nature's current state can be considered as a possible method for environmental education at elementary school. In summary, environmental education in elementary school should be seen as more than just existing knowledge and an educational system of curriculum, but should be related with a child's whole life.

As for ‘experience-oriented environmental education’, students can gain a correct understanding of environmental education and do so through activities at school, at home, and in the community, and these are educational activities which allow practice of experiences and realization of needs, and do so, through direct action of a student individually or with a group. Experience-oriented environmental education does not mean merely learning which occurs outside of school on field trips. It can also includes things at school such as classes, creative experiential activities, and after-school activities, and can also refer to activities at home or in the community which help to form an environmentally friendly lifestyle (Choi and Noh, 2000). Accordingly, through the curriculum and the creative experience-oriented environmental education time, students understand the meaning of environmental conservation and are able to form habits of practice and it should be intentional and systematically planned practice.

C. Emotional intelligence

The emotional index EQ, which is the abbreviation of ‘Emotional Quotient', is a concept that is contrasted with the intelligence index (IQ). Understanding EQ requires an understanding of emotional intelligence (Salovey et al., 1995). At present, emotional intelligence is defined as “the ability to check your own emotions and the emotions of others, ability to distinguish those emotions, and ability to use this information to guide your own thoughts and behavior”. This paradigm of emotional intelligence can be understood to be a head and heart-oriented state of balance. There is a report that emotional ability such as the ability to overcome frustration, the ability to control emotions well, the ability to get along well with others, etc. has a greater impact on a successful life than general intelligence (Salovey et al., 1999).

The time is expected to come when those people or companies who are able to consider the benefits of the entire community will succeed. The days of competition have past and the age of cooperation is on its way. In other words, rather than being smart on your own and getting ahead of others, it will be the ability to cooperate with others and consider the welfare of the community as a whole which will be visible in those individuals or businesses that are expected to enter an era of success. This change is one which puts others above self and places more importance on the benefit of society rather

than the individual, and in the end this change is seen as being based on the perception of change in which supports profit for both the interests of the individual and society. In this era of emphasized emotional intelligence, it will be necessary for school education to intentionally put into action changes in Emotional Education (Kim and Hong, 2015).

If we consider the relationship between creative experience education and emotional intelligence, creativity is more likely to refer to activities in which some existing thing is used to create something new, rather than activities in which something is made out of nothing. Perceiving both the Changes and demands of the Environment around us may very well be the beginning of creative education. However, if we have no perception of our surrounding environment and just chase after the convenience of life and if we live our lives divergent from nature, who knows when even our intrinsic creativity as humans will be lost.

In other words, in the case of emotional intelligence, with the emphasis on recognition of one's feelings in emotional intelligence such things as management of emotions, motivation, improvement of empathy, development of interpersonal relationships, etc. can be seen as very important factors for development of creativity.

<Table 2> presents that search for domestic papers related to environmental education, elementary school students and emotional intelligence.

<Table 2> The previous related to this study

Researcher (year)	Research titles
Ryu, C. S. (2003)	The relation of the plant environment of school and the human nature of the student in elementary school.
Jang, S. & Park, C.M. (2005)	Study on the effect of Environment Education through experience activity within elementary students.
Kim, J. H. (2007)	Effect of Plants Education on the Career Attitude Maturity to Elementary School Students.
Son, H. E. & Son, J. H. (2010).	The Effect of Environmental Education-based on Plant Cultivation Activities on Children's Environmental Perception and Self-esteem.
Ceong, C. & Kwon, N. (2011)	School Environmental Education through the Creative Experiential Activity in the 2009 Revised National Curriculum.

Oh, D. K. (2011)	The development of green technology education program for Elementary school creative activities.
Kim, H. J. & Song, H. S. (2013)	Analysis of Attitude Changes of Elementary Students toward Work through School Garden Experiences.
Lee, Y. K. & Son, J. H. (2016)	Effects of 'PAE-STEAM-Environment' Program in Environmental Literacy and Creative Problem Solving of elementary students.
Hur, S. (2015)	A Study on the Implementation of Creative Activity Curriculum in Elementary Schools.
Son, M. J. & Son J. H. (2017).	The Effect of the Nature Experience Activities on Social Skills and ADHD Symptoms of Elementary School Students.

III. Research Methods

A. Research subjects and experimental design

The sample for this study was comprised of 55 students from 2 fourth grade classes in 'B' elementary school located in the city of Daegu, and the experiment group and the comparative group were determined. For the experiment group the creative experience-oriented environmental education program was applied and a general environmental education program was applied in the case of the control group. <Table 3> presents the experimental design.

<Table 3> The experimental design

Group	Control	Experiment
Teaching Method	A general environmental education	The creative experience-oriented environmental education
Inspection	**Pre-test**	
	Post-test	

Male student	17	16
female student	12	10
Total	29	26

B. Research tools

This study attempts to verify its hypothesis and the experiment survey used was comprised of 50 items or questions. The research tool used for measurement of emotional intelligence from Park and Son (2010). The survey used was modified and supplemented to meet the purpose of this study. Each question on the questionnaire used the 5-level Likert scale as a rating scale method and points were assigned as follow: “strongly disagree” as 1 point, “disagree” as 2 points, “neutral” as 3 points, “agree” as 4 points, “strongly agree” as 5 points.

In this study the validity of the created questionnaire was verified by expert preliminary inspection. First in this study, before the preliminary examination and in order to verify validity, expert consultation was arranged and the composition feasibility of the pre-written question items was verified.

In the preliminary inspection of this study, the researcher asked that contents of the survey be examined point by point, in order to point out which of the explained concepts were unclear, or which words, sentences, or contents were difficult to understand, and in particular to determine how well each item represents each given concept, and how well unique meaning of specific content areas is represented. Through a process like this such points were reflected by the survey inspection report.

The reliability value of the questionnaire in this study was 0.734 on the Cronbach's value scale.

C. Procedures of this study

In this study, the purpose was to determine what effect creative experience-oriented environmental education has on elementary school students' emotional intelligence. For this purpose a program for creative experience-centered environmental education was constructed and then ran for about 30 lessons.

A pre-test was carried out in order to investigate the homogeneity of the experimental group and the control group before running the experiment, and this test showed no differences between the two groups <Table 4>.

<Table 4> Comparison of homogeneity between control and experiment group

The sub-elements of emotional intelligence	Control (n=29)		Experiment (n=26)		t	p
	M	SD	M	SD		
Self-awareness	34.28	5.69	35.24	5.91	.501	.811
Self-control,	34.70	6.01	34.76	6.71	.381	.706
Self-synchronization	33.02	5.66	32.10	6.48	.338	.738
Empathy	30.94	7.00	31.72	5.89	.498	.801
Interpersonal skills	33.13	6.12	33.48	6.12	.365	.812
Total	166.07	30.48	167.3	31.11	.5.78	.8.00

However, in this study, in order to find out the degree of improvement for both the experimental group which utilized the creative experience-oriented environmental education program, and for the comparative group which did not in terms of the total scores for emotional intelligence and the sub-elements of emotional intelligence such as self-awareness, self-control, self-synchronization, empathy, interpersonal skills, the average (M) and standard deviation (SD) were calculated and t-verification was carried out. Especially in the case of the experimental group for the sake of comparison of the pre-test/post-test, paired t-verification was executed. SPSS/ WIN 20 was used for this analysis.

IV. Research Results and Interpretation

A. Environmental education through curriculum reconstruction

1. Reconstruction of environmental education course units

Based on curriculum analysis, an annual instruction plan was established, and 30 hours of instructional time were set aside for classes and creative experience-based activities.

In order to achieve systematic instruction of environmental education, as shown in <table 5> the suitable content was extracted, and the environmental education related courses and annual instruction plan restructured properly in accordance with the purpose of this study.

<Table 5> Environmental education related subject's annual guidance contents

Subject name	Academic subject	Educational element
Science	Conditions of soil in which plants grow well	Identify soil conditions where plants grow well
	The process of making soil	Knowing the meaning of weathering Valuable soil resources
	Conditions required for plant growth	Identifying the effects of water and temperature on plants
	Why water is precious	Know the importance of water and learn how to reduce water use Weathering
Social	Climate characteristics of our region	Finding a variety of materials to understand climate features Interest in local climate change

	Troubleshoot our area	Find solutions to air and water pollution in our region
	Inter-regional cooperation for problem solving	Joint efforts for the establishment of environmental infrastructure facilities
Art	Studying the characteristics of wood	Know the characteristics of a tree and paint it

2. Content areas and elements extraction of environmental education

When the findings from prior major research on school environmental education are examined, it becomes apparent that the partial areas of “nature conservation”, “nature restoration” and “environmental cleanup” can be integrated into environmental preservation (Choi, 2006).

Through such content and areas of school environmental education, the vertical-horizontal connectivity should be maintained, and this means specific areas and contents should be instructed without emphasis or omission. However, because the above suggested areas cannot all be digested within the set time, the areas in this instruction manual were simplified according to levels of development in the lower grades of elementary school as shown in <table 6>.

<Table 6> Areas and contents of environmental education in this study

Area	Contents
Water	Converting to clear water, I need clear water. Charcoal is a juggler.
Air	Clean air and dirty air. I want to live in clean air.
Soil	Soil in the forest.
Bio	Creatures living in rivers. Find my tree. Experience learning with a magnifying glass.
Resource	Dyeing with persimmon. Washing hair with irises, dyed with pine cones. Put blooms on the fingernails. Dyeing with fruit peels. Making recycled frames using waste products.

B. Creative experience-oriented environmental education

1. Creative experience-oriented Environmental Education instruction plan

For the sake of systematic instruction of environmental education, with the exception of the 8th lesson in the course, lesson time was provided for environmental education in creative experiential activity as is shown in〈Table 7〉and the program was run for roughly 22 lesson times.

〈Table 7〉Creative experience-oriented Environmental education instruction

Annual Lesson Plan	Guidance on environmental education	Class time	Environmental area
April	Experience green environment class room	1	Bio
	Eco-friendly soap making	2	Water
May	Dyeing a handkerchief using grass leaves and petals	2	Water
	Making dolls with pine cones and natural materials	2	Bio
	Make owns mini flowerpot using PET bottles	1	Resource
	Making environment-friendly scrubbing with acrylic yarn	2	Water
June	Planting the wildflower in a pot	2	Soil
	Painting with natural materials, such as stones, wildflowers, fish etc.	2	Bio
August	Making insects using old trees, raising a love for nature	1	Resource
September	Designing endangered animals using natural materials with unique shapes and colors	1	Bio
	Making nature-friendly bookmarks using tree branches, shells, and leaves	2	Bio
	Create your own calendar using a variety of natural products	4	Bio, Water, Soil, Resource

C. Analysis results

In order to investigate the influence creative experience-oriented environmental education has on elementary school students' emotional intelligence, pre-tests and post-tests were implemented to check improvement in emotional intelligence.

1. Results for post-test of experimental group and control group

This study compared the results from the post-test of both groups in order to investigate if there is a significant difference in the influence creative experience-oriented environmental education has on elementary school students' emotional intelligence, the results of this analysis are shown in <Table 8>.

<Table 8> Results for post-test of control and experimental Group

The sub-elements of emotional intelligence	Control (n=29)		Experiment (n=26)		t	p
	M	SD	M	SD		
Self-awareness	34.59	5.94	37.48	4.56	2.070	.048
Self-control,	35.28	4.58	38.03	4.68	2.085	.046
Self-synchronization	34.48	4.20	36.24	4.84	1.365	.183
Empathy	31.34	6.18	34.62	6.08	1.973	.058
Interpersonal skills	33.66	5.09	37.51	5.48	2.798	.009
Total	169.35	25.99	186.85	25.64	2.582	.024

In order to determine the effect of the creative experience-oriented environmental education activity on elementary school students' emotional intelligence, preliminary inspection and identical evaluation tests were used for both the experiment group and the control group, and the emotional intelligence examination was conducted. In the emotional intelligence inspection results, following the application of creative experience-oriented environmental education, the ability to recognize self-emotion and ability of self-control had statistically significant increases ($p<0.05$). Although increases

were recognized in self-synchronization ability and empathic ability through the activity of creative experience-oriented environmental education, the differences were not statistically significant. Especially, among the 5 sub-areas of emotional intelligence which were influenced, interpersonal skills was recognized to have the biggest difference ($p<0.01$). Looking from a comprehensive stance, creative experience-oriented environmental education is recognized to have a significant effect on elementary school students' emotional intelligence ($p<0.05$).

V. Conclusions and Proposals

A. Conclusions

This study's purpose was to establish the effects that creative experience-oriented environmental education has on the emotional intelligence of elementary school students.

The results of this study are as follow:

This study emphasizes the importance of restructuring curriculum by teachers, and it is considered that it seems to have positively influenced the experience-oriented environmental education in elementary school. First of all, creative experience-oriented environmental education had an effective impact on elementary school student' emotional intelligence. Based on the above results, when students were taught in class using the environmental education program with restructured subject units and matched to in-school locations, students' emotional intelligence improved. This is in contrast to the conventional method in particular that the learner becomes the subject of the learning task, selects the required tasks, and determine suitability, and then through investigating, solving, and practical application, it is thought the probability of developing emotional intelligence will increase. This is determined possible because in this process there is a new perspective and flexible thinking which improves problem solving ability. Moreover, the class utilizing the experiential activity program centered on environmental education promotes ecological sensitivity to students and gives them a life centered value orientation which gives them clues to solve environmental problems and a growing sense of respect for nature and this can be seen as one of the effects of the class.

As mentioned above, for learners in the environmental education class to improve their emotional intelligence school, in order for the school environmental education to be expanded to the home and community, environmental experience program development and systematic public practical education are needed. This study showed the same result as the previous study, nature-friendly educational activities increases the emotional

intelligence of preschool students and have a positive effect on environment friendly attitude (Jeon, 2015)

B. Proposals

Based on the results of this study, the following are suggested:

First, because creative experience-oriented environmental education activity has educational worth, not only does it have a have a positive effect on development of emotional intelligence, but also on various aspects of elementary school students' development such as emotions, perception, character, etc. Accordingly, empirical research is required on various aspects of the effects of creative experience-oriented environmental education activity.

Secondly, in this study the effect of the creative experience-oriented environmental education activity on elementary school student`s emotional intelligence was verified through the quantitative approach, and qualitative research related to individual student emotional intelligence almost never occurred. Therefore, in providing of the creative experience-oriented environmental education activity Program, there is also a need to carry out qualitative research which examines the individual students emotional change process.

Third, this study was conducted over a 16-week period to verify the effects of the creative experience-oriented environmental education activity on elementary school students' emotional intelligence. A study is needed to better examine other effects of long term implementation of at least one year.

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